AFQTP 3E5X1-19
1 MAY 01

AIR FORCE

QUALIFICATION TRAINING PACKAGE (AFQTP)

for

ENGINEERING

(3E5X1)

MODULE 19

AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES

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MODULE 19

AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES

Career Field Education and Training Plan (CFETP) references from 1 Apr 97 version

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AIR FORCE QUALIFICATION TRAINING PACKAGES
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ENGINEERING
(3E5X1)

INTRODUCTION

Before starting this AFQTP, refer to and read the "Trainee/Trainer Guide" located on the AFCESA Web site **http://www.afcesa.af.mil/.**

AFQTPs are mandatory and must be completed to fulfill task knowledge requirements on core and diamond tasks for upgrade training. ***It is important for the trainer and trainee to understand*** that an AFQTP ***does not*** replace hands-on training, nor will completion of an AFQTP meet the requirement for core task certification. AFQTPs will be used in conjunction with applicable technical references and hands-on training.

AFQTPs and Certification and Testing (CerTest) must be used as minimum upgrade requirements for Diamond tasks.

MANDATORY minimum upgrade requirements:

Core task:

AFQTP completion
Hands-on certification

Diamond task:

AFQTP completion
CerTest completion (80% minimum to pass)

Note: *Trainees will receive hands-on certification training for Diamond Tasks when equipment becomes available either at home station or at a TDY location.*

Put this package to use. Subject matter experts under the direction and guidance of HQ AFCESA/CEOT revised this AFQTP. If you have any recommendations for improving this document, please contact the Career Field Manager at the address below.

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MINIMUM OPERATING STRIP SELECTION

MODULE 19 AFQTP UNIT 1

PERFORM AIRFIELD DAMAGE ASSESSMENT SURVEY (19.1.1.2.)

&

PERFORM EXPLOSIVE ORDNANCE RECONNAISSANCE (19.1.1.3.)

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PERFORM AIRFIELD DAMAGE ASSESSMENT SURVEY & PERFORM EXPLOSIVE ORDNANCE RECONNAISSANCE (EOR)

Task Training Guide

STS Reference Number/Title:	19.1.1.2. Perform airfield damage assessment survey 19.1.1.3. Perform Explosive Ordnance Reconnaissance
Training References:	• Prime BEEF Wartime Task Standard (17 April 1989) • AFPAM 10-219, Vol. IV, Chapter 2 • Training Video 613665 -- Damage Assessment Team (DAT) Operations (Sep 99)
Prerequisites:	• Possess as a minimum a 3E531 AFSC • Must have completed volume 2. The Wartime Mission 3E551A Engineering Journeyman Career Development Courses
Equipment/Tools Required:	• Data recording and reporting equipment; to include forms, clipboards, and writing instruments • 1:400 grid map, 1:100 airfield pavement map with runway and station post indicated • Radios and spare batteries • Binoculars
Learning Objective:	• Be able to assess an existing runway surface to determine the amount, type and accurate location of airfield damage and UXOs
Samples of Behavior:	• Accurately locate UXOs and airfield damage caused by bombs, UXOs, etc. Include data information regarding type, location and number

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PERFORM AIRFIELD DAMAGE ASSESSMENT SURVEY & PERFORM EXPLOSIVE ORDNANCE RECONNAISSANCE (EOR)

Background: During contingency situations one of the first considerations at any installation is the airfield status. Whether civil engineers are supporting bed down operations at abandon airfields or engaged in airfield damage recovery operations one of the first priorities is an airfield damage assessment. The methods of assessment and the speed performed will depend on mission requirements. However the overall concepts of damage assessment are the same no matter what the mission. The focus of this QTP is assessment during airfield damage recovery operations where speed is essential. Airfield damage assessment is the first step in airfield recovery operations. The Airfield Damage Assessment Team (ADAT) becomes the eyes of recovery operations and are responsible for assessing the condition of the airfield pavement surface, along with locating UXOs. The ADAT is made up of EOD technicians, engineering technicians and augmentees. Airfield repair operations cannot begin until the assessment portion is completed so remember speed is crucial.

To perform this task, follow these steps:

Step 1: Identify Airfield Damage Assessment Team (ADAT) composition: Team members should be identified long before the need for damage assessment occurs. It is important that all team members fully understand each other's role during damage assessment operations. The team consists of:

- ***One Engineering Technician (3E5X1)***
  -Determines airfield pavement damage/UXO location
  -Assists EOD with explosive safety procedures, and setup of explosive actuated tools
- ***Two EOD Technician (3E8X1)***
  -Identifies and classifies UXOs
  -Performs immediate action procedures on required UXOs
  -Responsible for team's movement where UXOs exist
  -Trains team on proper explosive safety procedures, setup of explosive actuated tools
- ***One or more Augmentees***
  -Assists with damage recording, driving, and radio communication

Note:
If possible replace the augmentee position with another 3E5X1. Additionally with the limited availability of augmentees this position may have to be left vacant.

Step 2: Determine Team Working Procedures: If the ADAT is going to be able to complete its assessment in the timeliest manner, it's vital that good working procedures amongst the team be established and practiced. EOD and the 3E5X1s will have to work together to ensure all requirements are met in the shortest time possible. EOD will determine the safe route of travel while assessing the airfield surfaces. It is common for EOD to travel in their own vehicle, if this is the case, establish stand off distances and communication procedures. No matter the mode of travel, establish who has priority at each point of the operation ensuring all requirements are met.

- EOD determines the route of travel on the airfield
- If working in separate vehicle establish stand off and travel behind distances
- Determine communication procedures.
- Establish between EOD and 3E5X1s, which has priority at each point of the assessment

Step 3: Establish Preplanned Travel Routes: Predetermined routes are developed based on prioritization of mission essential areas, ensuring all critical locations are assessed. Additionally preplanned routes eliminate the duplication of efforts. Being thoroughly familiar with the assigned travel routes will prevent delays in the assessment process.

- **Travel routes based on prioritized areas:**
  - -Take-off / Landing surfaces (Runways, taxiways, Alternate Launch/Recovery Surfaces) – Priority # one
  - -Access pavements
  - -Aircraft maintenance, arm/de-arm, & refueling areas
  - -Aircraft arresting systems
  - -NAVAIDS
  - -Aircraft parking & shelter areas
- **Other areas as specified by SRC**

Step 4: Setup Communication Procedures between team members and control centers: Good communication is essential in damage reporting and ultimately expedites Airfield Repair operations. Without proper communication, vital information will be lost causing delays in airfield damage recovery operations. Communication procedures must be established between the team and control centers.

- Ideal situation is for two radio frequencies
  - -CE radio frequency (use EOD net as alternative)
  - -EOD frequency
- Establish Communication priorities, what teams and information have priority
- Execute clear and concise transmissions
- COMM-out/radio silence procedures
  - -Establish procedures with control centers
  - -Establish alternative methods which are dependable and flexible
- Perform periodic radio checks
  - -Detects problems with radios
- Report items one at a time and wait for acknowledgement of message received.
- Call in periodic route checkpoints, informs control center of location
- Identify and annotate radio "dead-zones"
  - -Areas that radio transmissions can not be transmitted or received

Step 5: Establish Pavement Reference Marking System (PRMS): During airfield recovery operations the ADAT has to be able to accurately locate damage in an expedite manner. A pavement Reference Marking System (PRMS) is a visual reference system eliminating the need for time consuming measurements. Ultimately the PRMS increases speed and accuracy.

- Runway marking system that enables DATs to accurately locate damage/UXOs and allows successful communication of information during airfield recovery operations
- Installed on pavement surfaces used as Take off and Launch (TOL) surfaces and access routes
  - - Primary Operating Surfaces
  - -Alternate Launch and Recovery Surfaces (ALARS)
  - -Other surfaces capable of supporting aircraft (parallel taxiways, adjacent roadways, etc.)
  - -Expedient method, using visual reference, eliminates need for measurements
  - -Uses combination of raised and flush markers for redundancy to enhance survivability

- **PRMS Installation:**
  - Establish the **zero point** for the PRMS
    - -- Typically placed at the threshold
    - -- Once established it remains fixed (reference in one direction only)

  - Install raised (carsonite) markers
    - **-- Place at 50’ or 100’ intervals, from zero point, along length of the runway**
    - -- Position 25’ to 50’ from pavement edges

Figure 1

  - Place **flush** station markers
    - -- Mark at **50’** or 100’ intervals, from zero point
    - -- Mark centerline, pavement edge and if possible halfway between centerline and edges

Figure 2

Step 6: Initial reconnaissance: Provides a quick snap shot of the current situation and status of the airfield. Control centers can reprioritize the ADAT routes based on initial assessment. For example, the tower reports no damage on the secondary airstrip and multiple damage on the primary strip. The priority would then shift to a detailed assessment of the secondary strip first to ensure it was clear. As this surface could be ready to launch and recover aircraft the quickest**.**

- <u>PURPOSE</u> - Provides quick damage assessment of an airbase
- Pre-positioned observation teams report damage assessment (Control Tower, Air Base Point Defense Positions, Aircraft Shelter Areas, etc.)
- Allows Control Center to **redirect** DAT routes based on information received

Step 7: Detailed Damage Assessment / Locating Damage/UXOs: A detailed damage assessment is performed to accurately locate all airfield damage. This information is vital to the control center's decision-making process on the ability to launch and recover aircraft. A balance between speed and accuracy is essential. During airfield damage recovery operations the actual repair process cannot begin until the ADAT has completed its assessment, so speed is crucial. However the assessment has little value if it is not accurate. The ADAT must be able to locate damage on the runway within plus or minus one meter as required by the NATO Standardized Agreement 2929. This accuracy and speed can easily be achieved by practicing and following standard procedures. Size of the damage dictates the damage locating coordinate system used. When encountering UXOs EOD personnel will provide the type and description of the items. If EOD personnel are not available to provide the types of UXOs, refer to the Airmen's Manual (AF MAN 10-100). Three basic rules must be followed when locating damage, they are:

1. **Zero Point Rule: Once** established, it's **fixed!** Only reference from one direction
2. **Centerline Rule:** *All* distances are measured along the existing runway centerline, from zero point, to center of damage/UXOs
3. **Right/Left Rule:** *All* damage/UXOs are located left or right of existing runway centerline the center of damage/UXOs

NOTE: All measurements use English units **(feet)**

- **Coordinate System: (Single Point & Double Point)**

(a) **Single point coordinates** are used to locate single items or small groups.

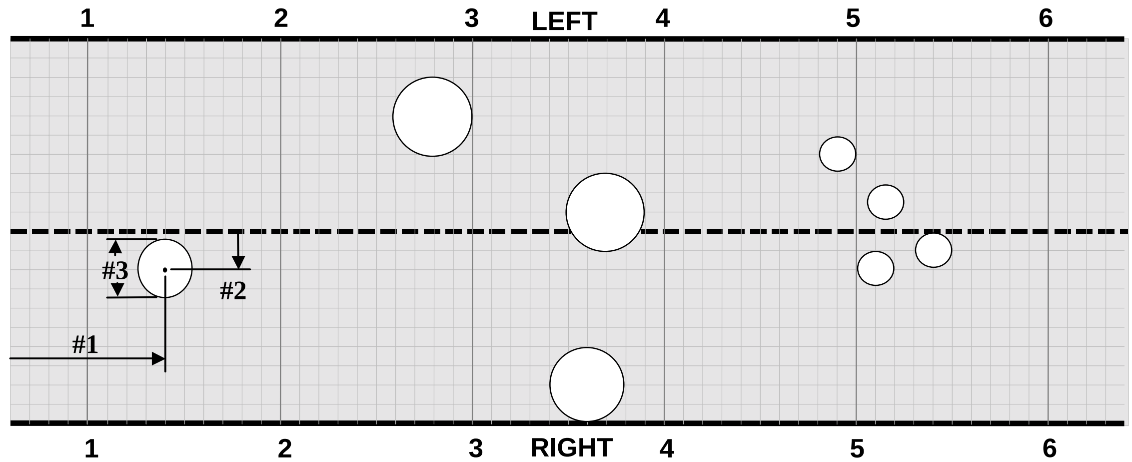
-List type of Damage/UXO: (Examples)

-- Crater	(C)	**C 1240 R 45 D 30**
-- Spall	(S)	**S 2700 L 15 D 50 N 30**
-- UXO	(X)	**X 4360 R 0 (FAB 250)**
-- Bomblet	(B)	**B 6730 L 33 D 80 N 15**
-- Camouflet	(C)	**C 8055 R 75 D 25 (Camouflet)**
-- Hole of Entry	(X)	**X 9610 R 90 D 2 (HOEEntry)**

- **Using the Single Point Coordinate System**

-Determine and record type of damage
-Estimate and record distance down pavement, from zero point (*Centerline Rule)*
-Determine direction & distance from existing centerline (*Right/Left Rule)*
-- Record **L** or **R**
-- Record Distance
-Estimate apparent diameter of crater/field/H.O.E.
-- Record **D**
-- Record measurement
-Count number of spalls/bomblets
-- Record **N**
-- Record number of spalls/bomblets
-Write description of item, if necessary.
-- UXO info (Color code, nose fuse, tail fuse, shape, size, etc.)
-- Utility damage, camouflet, water in crater, damage to NAVAIDS, etc.

Example 1: coordinates C140R20D30



Step 1: Determine the distance of crater from the zero point (140 feet)
Step 2: Determine distance left or right of existing runway centerline (20 feet, right)
Step 3: Determine the apparent diameter of the crater (30 feet in diameter)
Step 4: Enter data in your log, and report damage to the Control center

(b) **<u>Double Point Coordinates</u>** identify the outer boundaries of large areas of damage or large UXOs fields (Used *primarily* for *bomblet/spall* fields)

-- List type of damage:

-- Bomblet	(B)	**B330 L33 W0 F1200 R40 W100 N60 (PFM1)**
-- Spall	(S)	**S6820 R40 W10 F5980 L50 W120 N100**

HINT:
In cases of extreme damage, double point coordinates could be used for craters

- **Using the Double Point Coordinate System**
  - -Determine and record type of damage
  - -Estimate and record distance down pavement, from zero point, to center of field's leading edge (*Centerline Rule)*
  - -Determine direction and estimate distance to center of field's leading edge, from existing centerline (*Right/Left Rule)*
    - -- Record **L** or **R**
    - -- Record Distance
  - -Estimate width of field's leading edge
    - -- Record **W**
    - -- Record width
  - -Field identifier (F)
    - --Record **F**
    - **--**Signifies that additional coordinates are following
  - -Estimate and record distance down pavement, from zero point, to center of field's trailing edge (*Centerline Rule)*

-Determine direction and estimate distance to center of field's trailing edge, from centerline (*Right/Left Rule)*

-- Record **L** or **R**

-- Record distance

-Estimate width of field's trailing edge

-- Record **W**

-- Record width

-Count number of spalls/bomblets

-- Record **N**

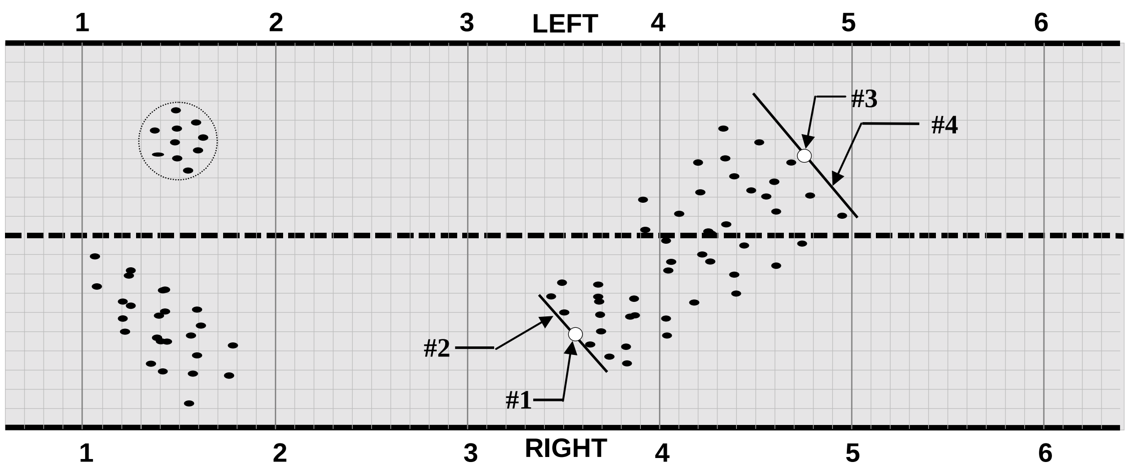
-- Record number of spalls/bomblets

-Write description of item, if necessary

-- Utility damage, camouflet, water in crater, damage to NAVAIDS, etc

-- UXO information (Color code, nose fuse, tail fuse, shape, size, etc.)

Example 2: coordinates S355R50W50F475L40W75N45



Step 1: Locate distance of center point of the leading edge of the field from zero point (355 feet approximately)
Step 2: Determine the distance left or right from existing runway centerline of center of leading edge of the field (50 feet, right)
Step 3: Determine the approximate width of the leading edge of field (50 feet)
Step 4: Locate distance of center point of the trailing edge of the field from zero point (475 feet, approximately)
Step 5: Determine the distance left or right from existing runway centerline of center of trailing edge of the field (40 feet, left)
Step 6: Determine the approximate width of the trailing edge the field (75 feet)
Step 7: Determine the approximate number of spalls in the field (45 spalls)
Step 8: Enter data into your log, and report damage to the control center.

- **Crash Grid Coordinate System:** Used to locate damage/UXOs in areas not supported by PRMS and precise location is not as critical. Also, can be use for TOL surfaces where PRMS is not installed. The grid coordinate system is based on the Base Comprehensive Plan (BCP) tab O-3. Use caution when using this system due to the errors that exist when using different scale grid maps between the ADAT and control centers.
  - -Grid North always referenced to *top* of map
  - -Reference grid's lower left hand corner
  - -Always read grids *right* and *up*
  - -Numbers increase from *left* to *right*
  - -Letters flow in alphabetical order from *bottom* to *top*
  - -Each grid encompasses 1000' x 1000' area
  - -Subdivisions can be simplified to smaller grids of 100' x 100' using a grid overlay

- **Using the Grid Coordinate System**
  - -Locate point on grid map
  - -Read numbers *righ*t to grid containing the damage/UXO (1, 2, 3, etc)
    - -- Reference lower left hand corner of grid location
    - -- Overlay or measure, using scale, grid (.1, .2, …, .9)
    - -- Record grid coordinate
  - -Read letters *up* to grid containing the damage (A, B, C, etc)
    - -- Reference lower left hand corner of grid location
    - -- Overlay or measure *up*, using scale
    - -- Record grid coordinate, (.1, .2, …, .9)
  - -Write description of item, if necessary. Include following notable information:
    - -- Utility damage, camouflet, water in crater, damage to NAVAIDS, etc
    - -- UXO information (Color code, nose fuse, tail fuse, shape, size, etc.)
    - -- Determine if aircraft can taxi past damage to access/egress

Step 8: Ensure Damage Assessment is relayed to the Control Centers: The ADAT should be relaying damage information to the appropriate control centers during the assessment process. Immediately upon completion of the damage assessment route the team should bring a hard copy of the damage found to the appropriate control center ensuring all inputs were properly transmitted.

Review Questions
for
Perform Airfield Damage Assessment Survey & Perform Explosive Ordnance Reconnaissance (EOR)

Question	Answer
1. What is the Airfield Damage Assessment Team (ADAT) composition?	a. 3 – EOD technicians, 2-3E5X1s, 1-Augmentee b. 2 – EOD technicians, 1-3E5X1s, 1-Augmentee c. 1 – EOD technicians, 1-3E5X1s, 2-Augmentee d. 1 – Site Developer
2. When expressing crater location, what measurement is used?	a. The leading edge of the crater b. The trailing edge of the crater c. The center of the crater d. The left edge of the crater
3. What does the letter "S" identify when locating airfield damage?	a. Suppression in the airfield surface b. Spall c. Site Developer d. Second input
4. How are grid coordinates read?	a. Left and down b. Right and up c. Right and down d. Left and up
5. How are large bomblet fields located?	a. Very carefully b. Using the double point coordinate system c. Using Initial reconnaissance d. Using the single point system

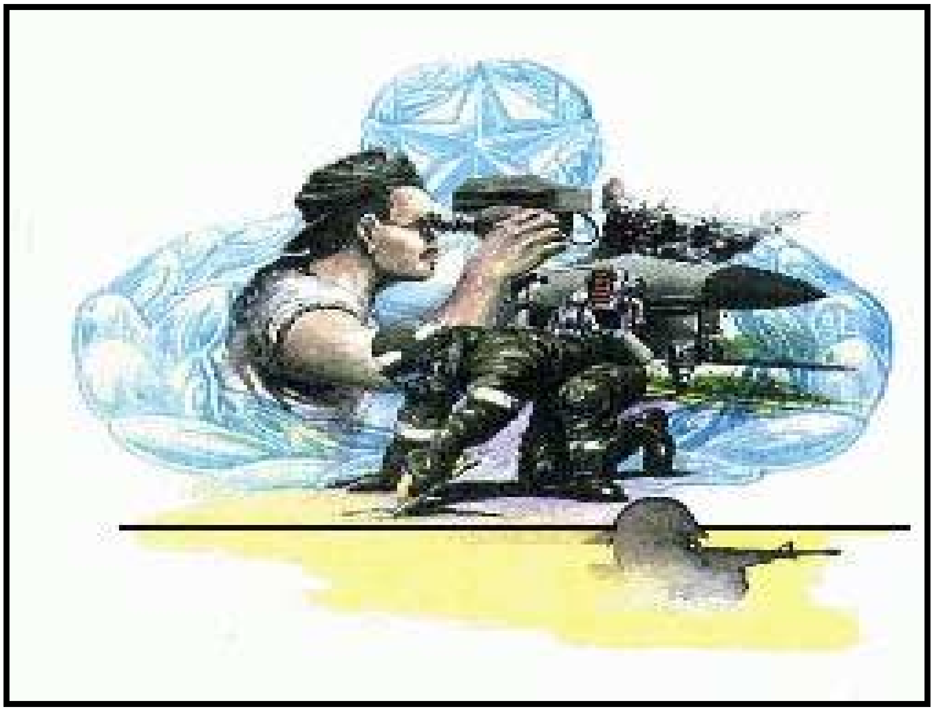
NOTE: After completing all lessons for Explosive Ordnance Reconnaissance (EOR), see your Unit Education and Training Manager to take the following **mandatory** CerTest:

Test no.	**Title**
8083	**Minimum Operating Strip Selection**

PERFORM AIRFIELD DAMAGE ASSESSMENT & EXPLOSIVE ORDNANCE RECONNAISSANCE SURVEY

Performance Checklist		
Step	**Yes**	**No**
1. Was all airfield damage and UXOs identified?		
2. Were the following items accurately located? (a) Craters (b) Spall Fields (c) Bomblet Fields (d) Unexploded Ordinance (UXO)		
3. Were the coordinates of airfield damage reported in the proper format? (a) Craters (b) Spall Fields (c) Bomblet Fields (d) UXOs		
4. Was damage properly identified using grid coordinates?		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the minds of both the trainee and trainer.



MINIMUM OPERATING STRIP SELECTION

MODULE 19 AFQTP UNIT 1

PERFORM AIRFIELD DAMAGE PLOTTING (19.1.1.7.)

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PERFORM AIRFIELD DAMAGE PLOTTING

Task Training Guide

STS Reference Number/Title:	19.1.1.7. Perform airfield damage plotting
Training References:	• Prime BEEF Wartime Task Standard (17 April 1989) • AFPAM 10-219, Vol. IV, Chapter 2
Prerequisites:	• Possess as a minimum a 3E531 AFSC • Must have completed volume 2, The Wartime Mission, 3E551A Engineering Journeyman Career Development Courses
Equipment/Tools Required:	• 1:1200 (1”: 100’) airfield pavement map with pavement reference makings indicated • Scales • Templates • Writing implements • Radios
Learning Objective:	• Should be able to accurately plot airfield damage and UXOs
Samples of Behavior:	• Plot airfield damage and UXOs

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PERFORM AIRFIELD DAMAGE PLOTTING

Background: During airfield damage recovery operations it is imperative that an accurate reflection of the airfield status be provided, indicating the current situation. This information must be depicted in the control center as soon as possible. The Airfield Damage Assessment Team (ADAT) inputs are used to produce an accurate map indicating exact locations of damage and UXOs. This crucial map gives the decision-makers a tool to evaluate airfield operational status and choose a Minimum Operating Strip (MOS) if the need arises. Accurate plotting is the first stage in locating a MOS in airfield recovery operations. In addition to MOS selection, the airfield damage map is used to plan haul routes, estimate repair time, and avoid dangerous UXO locations. Speed is essential during the plotting phase; however, accuracy cannot be sacrificed.

To perform this task, follow these steps:

Step 1: Initial Preparation: Gather materials
- 1:1200 (1"=100') Airfield Map with pavement reference markings indicated
- Engineer Scale
- Circle Template
  - -- Premark template
  - -- Double the crater diameters (20' crater is plotted at 40'—repair size)

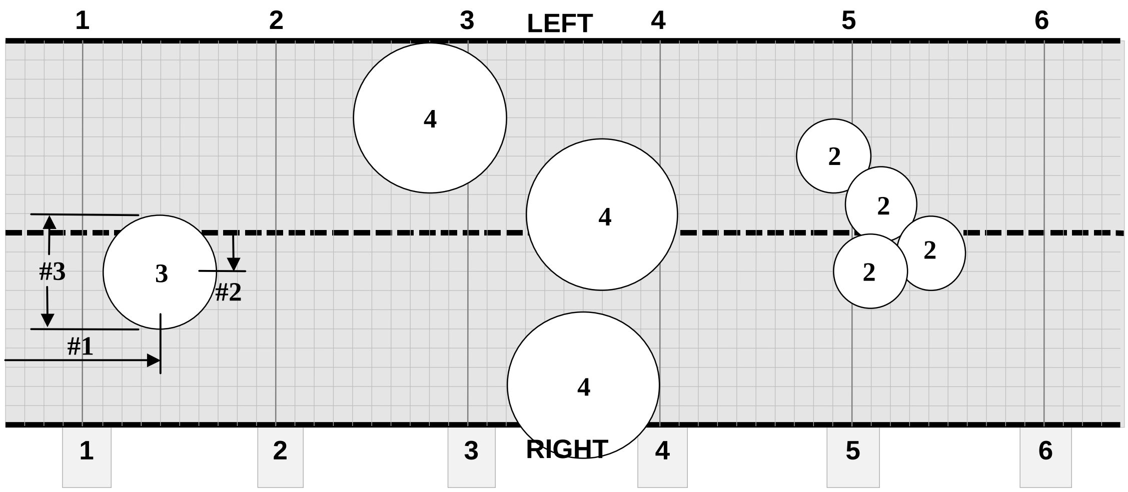
Step 2: Receive Inputs from ADAT: The plotter should plot the airfield damage as inputs are received from the ADAT. This increases the speed of the airfield recovery process.

Step 3: Plot Airfield Damage: When plotting, it is vital that the plotter fully understand the coordinate systems. Concerning the single point coordinate system, the first portion of the coordinate is the type of damage, followed by the distance down the runway from the zero point. After the distance down the runway, either a right (R) or left (L) distance from the existing centerline is provided. The last part of the coordinate is the diameter (D). The plotted diameter is twice the assessed size. The doubling of the crater diameter equals the approximate repair size. The double point system is a bit more complicated but can be mastered with practice. Again the first part of the coordinate is the type of damage followed by the distance down the runway from the zero point. After the distance down the runway a right (R) or left (L) distance from the existing centerline is provided. This right (R) or left (L) distance from the existing centerline is measured to the center of the field's leading edge. Next there will be a width of the leading edge of the field followed by a field identifier (F) indicating a double point coordinate. After the field identifier will be the distance from the zero point to the trailing edge of the field; either a right (R) or left (L) distance from the existing centerline; width of the trailing edge. The last part of the double coordinate will be a number (N) of items in the field.

- **Symbols – Types of Damage**

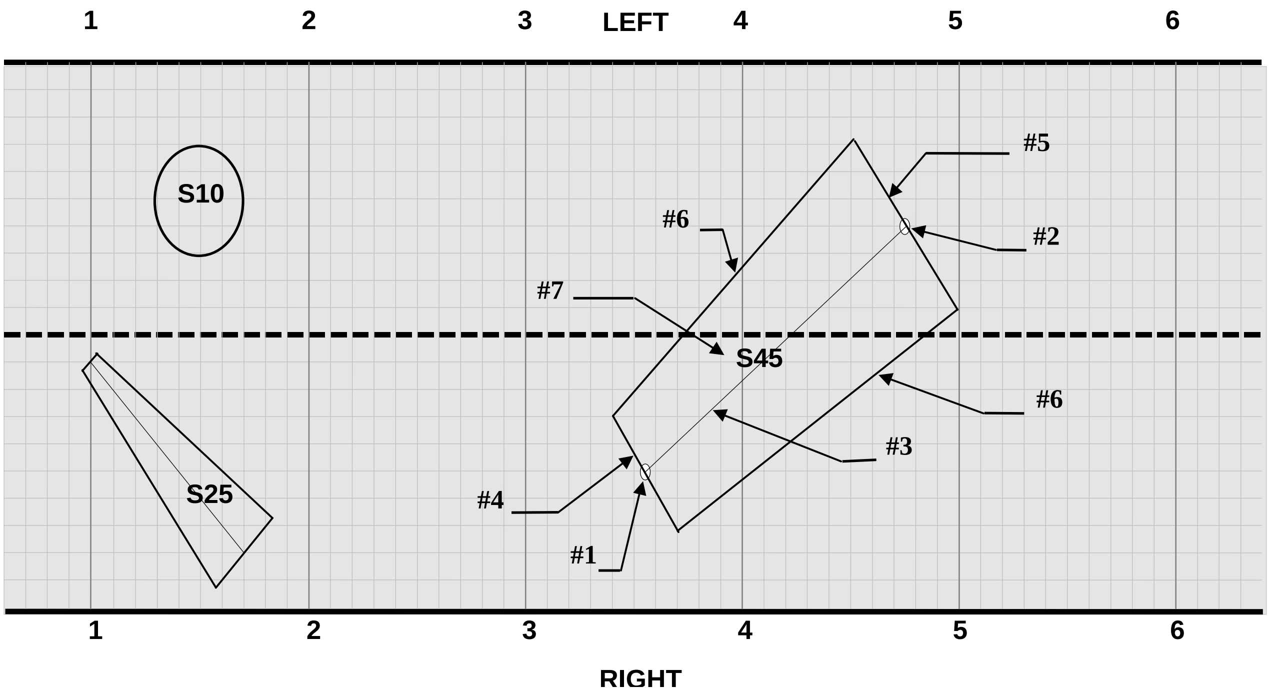
- Crater	(C)	**C 1240 R 45 D 30**
- Spall	(S)	**S 2700 L 15 D 50 N 30**
- UXO	(X)	**X 4360 R 0 (FAB 250)**
- Bomblet	(B)	**B 6730 L 33 D 80 N 15**
- Hole of Entry	(X)	**X 9610 R 90 D 2 (Hole of Entry)**

Example 3: Single Point Coordinate – C140R20D30



- **Step 1:** Locate the distance from the zero point. (140 feet)
- **Step 2:** Locate the distance left or right of the existing runway centerline; this becomes the center of the plotted crater.(20 feet, right)
- **Step 3:** Determine the repair diameter of the crater, and plot the crater. *Double the apparent diameter*. (60 feet in diameter)
- **Step 4:** Label the crater with the apparent diameter digit. (3 represents 30 feet.), UXOs are labeled with an "X".

Example 4: Double Point Coordinate – S355R50W50F475L40W75N45



- **Step 1:** Locate center point of the field's leading edge from the zero point and the distance left or right of the existing runway centerline (355 feet down, 50 feet right)
- **Step 2:** Locate center point of the field's trailing edge from the zero point and the distance left or right of the existing runway centerline (475 feet down, 40 feet left)
- **Step 3:** Connect the leading edge and trailing edge center points
- **Step 4:** Draw the leading edge width perpendicular to the line drawn in step 3
- **Step 5:** Draw the trailing edge width perpendicular to the line drawn in step 3
- **Step 6:** Connect the end points of the lines drawn in steps 4 and 5
- **Step 7:** Label the field either "S" or "B" designating it as a spall or bomblet field and add the number of spalls or bomblets

Step 4: Verify Plot Against the ADAT information: Once all the airfield damage is plotted, the information should be verified against the hard copies of the ADAT reports as soon as possible. Remember, NEVER compromise accuracy for speed.

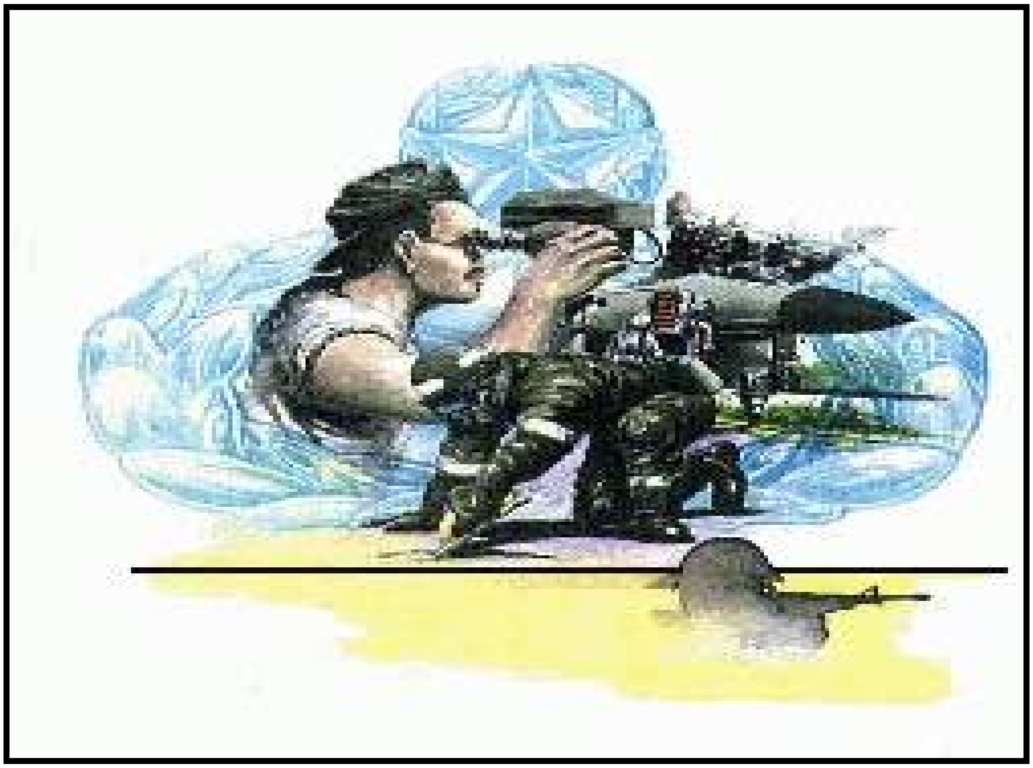
Review Questions
for
Airfield Damage Plotting

Questions	Answers
1. How are crater sizes plotted?	a. To the apparent diameter b. Half of the apparent diameter c. Double the apparent diameter d. Double the apparent radius
2. When plotting the coordinate X450R60, what does the number 450 indicate?	a. Distance down the runway from the threshold b. Distance from the departure end c. Distance left or right from the centerline d. Distance from the zero point reference
3. When plotting the coordinate S 850R35W50F1900L15W75N250, what does N250 indicate?	a. Damage input number 250 b. 250 spalls c. Runway designation d. 250 bomblets

PERFORM AIRFIELD DAMAGE PLOTTING

Performance Checklist		
Step	**Yes**	**No**
1. Was the circle template properly marked?		
2. Was damage accurately plotted on the airfield map? (a) Craters (b) Bomblet Fields (c) Spall Fields (d) UXOs		
3. Was damage properly identified on the map? (a) Craters (b) Bomblet Fields (c) Spall Fields (d) UXOs		
4. Was the damage drawn to the proper scale?		
5. Were all craters drawn at double their actual size?		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the minds of both the trainee and trainer.



CRATER PROFILE MEASUREMENT (CPM)

MODULE 19 **AFQTP UNIT 1**

IDENTIFY EXTENT OF UPHEAVAL (19.1.2.2.)

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IDENTIFY EXTENT OF UPHEAVAL

Task Training Guide

STS Reference Number/Title:	19.1.2.2. Identify extent of upheaval
Training References:	• CDROM 3E5X1C-19.1.2. Crater Profile Management • Air Force Pamphlet 10-219, Volume 4, Chapter 5 • TO 35E2-5-1 • Local Procedures
Prerequisites:	• Possess as a minimum a 3E531 AFSC • Must have completed volume 2, The Wartime Mission, 3E551A Engineering Journeyman Career Development Courses
Equipment/Tools Required:	• Pair of "T" stanchions • Adjustable sight rod • Pavement marking material (Chalk or Paint)
Learning Objective:	• The trainee should be able to perform upheaval identification procedures
Samples of Behavior:	• The trainee should perform upheaval identification procedures
Notes:	
• Teamwork with Rapid Runway Repair (RRR) Team is very critical to the success of achieving the most expedient crater repair operation • A balance of speed and accuracy should be maintained during this entire process	

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IDENTIFY EXTENT OF UPHEAVAL

Background: With today's fast paced contingency rate, it is crucial that civil engineers maintain the capability to repair damaged airfield pavement in an expedient manner. The first step in repairing pavement damage is identifying the amount of pavement to be repaired. This is accomplished by using a method called Crater Profile Measurement (CPM). CPM is an expedient level survey using line of sight to identify damaged areas above or below the surrounding pavement. CPM is used to determine the amount of upheaval before crater repairs begin and to perform quality control checks during and after crater repairs. When identifying the extent of upheaval, simply place two stanchions of equal height parallel to the centerline on the undamaged pavement surrounding the crater. This will form an imaginary line-of-sight above the crater. A rod, with a target set at the same height as the stanchions, will identify upheaval (or sagging) areas of pavement. The target will rise or fall below the line of sight when the rod is placed on damaged pavement and will remain at a consistent height as the stanchions when placed on undamaged pavement.

Complete the CD-ROM, Crater Profile Measurement, 3E5X1C-19.1.2., for detailed instruction on identifying the extent of upheaval **Upon completion of the above mentioned CD-ROM, properly identify the extent of damaged pavement using training stanchions built according to specifications outlined in T0 35E2-5-1.**

NOTE: After completing all lessons, for crater profile measurement, see your Unit Education and Training Manager to take the following **mandatory** CerTest:

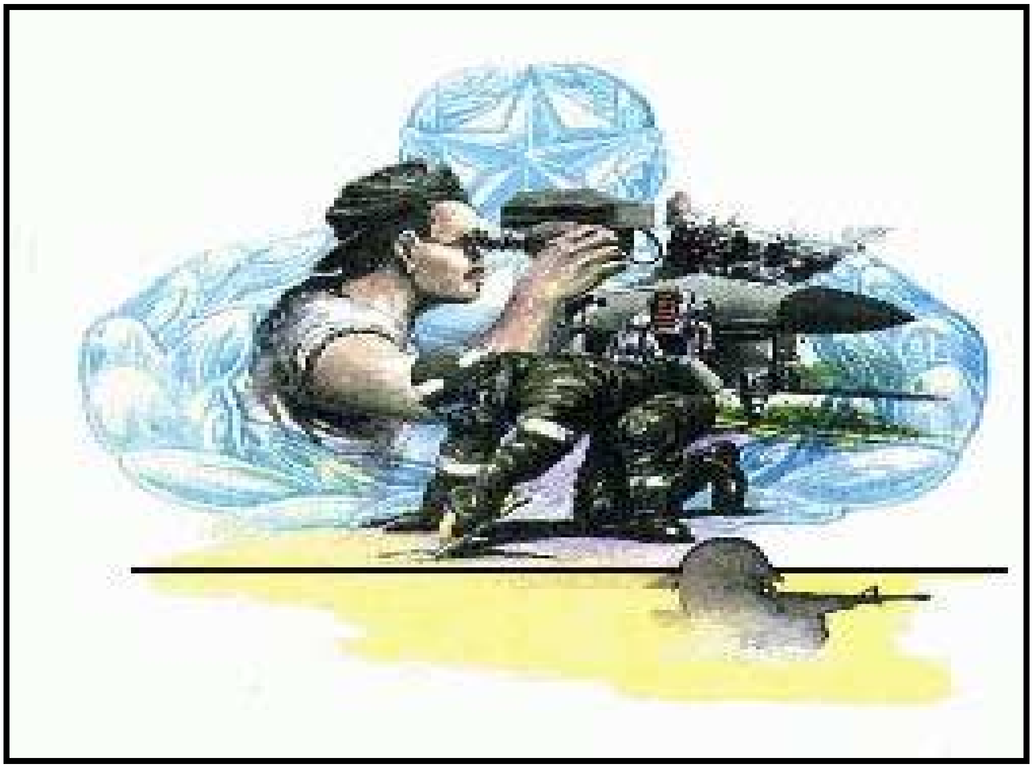
Test no.	**Title**
8081	**Crater Profile Measurement**

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

IDENTIFY EXTENT OF UPHEAVAL

Performance Checklist		
Step	**Yes**	**No**
1. Were stanchions of equal height placed on the undamaged pavement?		
2. Was the rod with a movable target set at the same height as the stanchions?		
3. Were stanchions located at least 25’ from crater’s edge?		
4. Was the line-of-sight parallel to the MOS centerline?		
5. Was a two-foot margin of error maintained during the upheaval marking process?		
6. Was the amount of upheaval around the crater properly identified and marked?		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the minds of both the trainee and trainer.



CRATER PROFILE MEASUREMENT (CPM)

MODULE 19 AFQTP UNIT 1

PERFORM INTERMEDIATE AND QUALITY CONTROL CHECKS (19.1.2.3.)

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

PERFORM INTERMEDIATE AND QUALITY CONTROL CHECKS

Task Training Guide

STS Reference Number/Title:	19.1.2.3. Perform intermediate and quality control checks
Training References:	• CDROM 3E5X1C-19.1.2. Crater Profile Management • AFPAM 10-219, Vol. 4 • TO 35E2-5-1
Prerequisites:	• Possess as a minimum a 3E531 AFSC • Must have completed volume 2. The Wartime Mission 3E551A Engineering Journeyman Career Development Courses
Equipment/Tools Required:	• Pair of “T” stanchions • Adjustable sight rod • Pavement marking material (Chalk or Paint) • CDROM 3E5X1C-19.1.2, Crater Profile Management
Learning Objective:	• The trainee should be able to perform intermediate and quality control checks
Samples of Behavior:	• The trainee should perform intermediate and quality control checks

Notes:

- Teamwork with Rapid Runway Repair (RRR) Team is very critical to the success of achieving the most expedient crater repair operation
- A balance of speed and accuracy should be maintained during this entire process

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

PERFORM INTERMEDIATE AND QUALITY CONTROL CHECKS

Background: When recovering a damaged airfield these checks are vital to a base's ability to quickly and safely launch and recover aircraft. It is paramount that damage airfield pavement be repaired to the highest quality possible accommodating today's premier aircraft while balancing repair time with mission requirements. The intermediate check phase of the Crater Profile Measurement (CPM) process ensures all pavement upheaval has been removed. While the quality control checks portion of CPM makes sure the crater repair teams achieve the proper repair quality criteria. Intermediate checks are critical during the repair phase to avoid unnecessary repair delays and ensure all damaged pavements are properly repaired. Once the crater has been backfilled and compacted a quality check is preformed to determine if the repair team has met the established repair quality criteria (RQC). Repair teams should strive for a flush repair on all crater repairs.

Complete the CD-ROM, Crater Profile Measurement, 3E5X1C-19.1.2., for detailed instruction on performing intermediate and quality control checks. **Upon completion of the above mention CD-ROM properly accomplish intermediate and quality control checks during damaged pavement repair process.**

NOTE: After completing all lessons, for crater profile measurement, see your Unit Education and Training Manager to take the following **mandatory** CerTest:

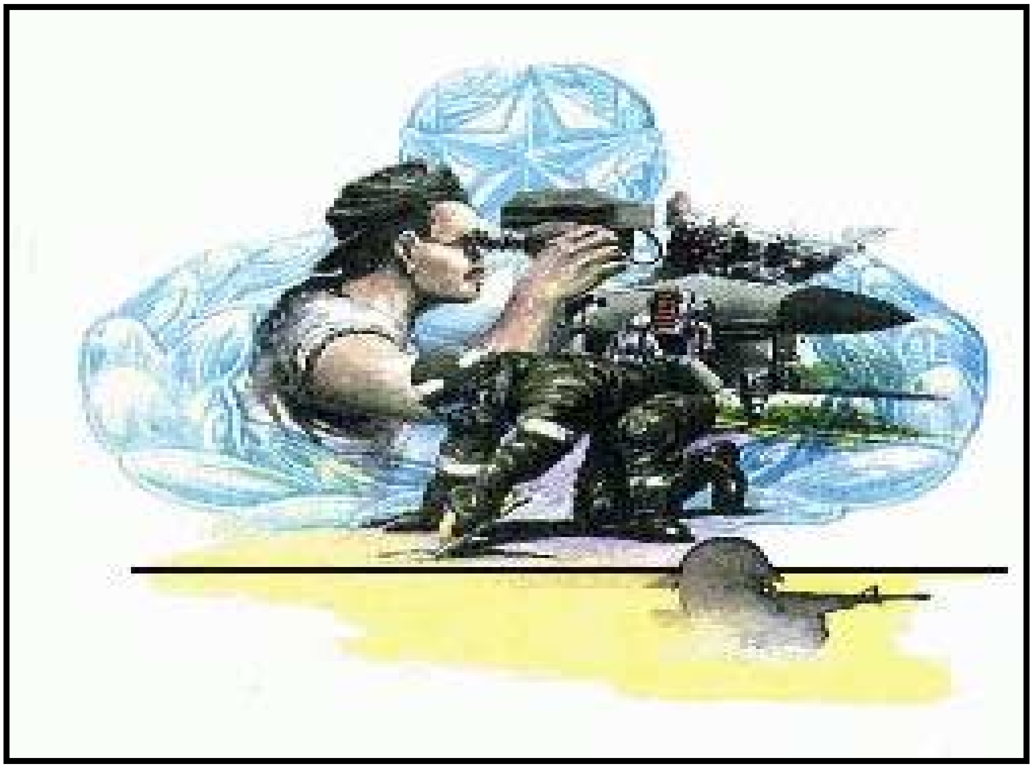
Test no.	**Title**
8081	**Crater Profile Measurement**

Notice. This AFQTP is ***NOT*** intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

PERFORM INTERMEDIATE AND QUALITY CONTROL CHECKS

Performance Checklist		
Step	**Yes**	**No**
1. Was the appropriate number of intermediate checks performed?		
2. Was the trainee able to properly identify any problem areas during the intermediate check?		
3. Was the target setup properly for the appropriate RQC value?		
4. Were quality control checks performed properly?		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the minds of both the trainee and trainer.



EXPEDIENT MOS CENTERLINE LAYOUT

MODULE 19 AFQTP UNIT 2

IDENTIFY MOS CENTERLINE LAYOUT REQUIREMENTS (19.2.1.)
&
IDENTIFY "T" CLEAR ZONE (19.2.2.)

IDENTIFY MOS CENTERLINE LAYOUT REQUIREMENTS
&
IDENTIFY "T" CLEAR ZONE

Task Training Guide

STS Reference Number/Title:	19.2.1. Identify MOS centerline layout requirements 19.2.2. Identify "T" clear zone
Training References:	• CDROM 3E5X1C-19.2, Minimum Operating Strip Layout • T.O. 35E2-6-1, Minimum Airfield Operating Surface Marking System • AFI 32-1042, Standards for Marking Airfields
Prerequisites:	• Possess as a minimum a 3E531 AFSC • Must have completed volume 2. The Wartime Mission 3E551A Engineering Journeyman Career Development Courses • CDROM 3E5X1C-19.2, Minimum Operating Strip Layout
Equipment/Tools Required:	• Traffic Cones • Vehicle200' Tape measure • Pavement marking material (Chalk or Paint) •
Learning Objective:	• Trainee should be able to layout a MOS centerline • Trainee should be able to identify and layout "T" clear zones
Samples of Behavior:	• Trainee should layout a MOS centerline • Trainee should layout "T" clear zone
Notes:	
• Teamwork with Rapid Runway Repair (RRR) Team is very critical to the success of achieving the most expedient crater repair operation • A balance of speed and accuracy should be maintained during this entire process	

IDENTIFY MOS CENTERLINE LAYOUT REQUIREMENTS &IDENTIFY "T" CLEAR ZONE

Background: During contingency situations, one of the first considerations at any installation is the airfield status. And an important airfield evaluation factor is airfield marking. Whether marking an existing runway in bed down operations or during airfield recovery operations, civil engineers will have limited time to ensure the runway is fully operational. The Minimum Airfield Operating Surface Marking System (MAOSMS) has been developed to provide the engineers with an expedient method to install a complete airfield marking system. One of the first steps during airfield recovery operations is the establishment of a new Minimum Operating Strip (MOS) centerline. This procedure is accomplished using traffic cones with expedient layout methods. During centerline layout operations, a clear zone is established on either side of areas requiring repairs. Placing three cones 100 feet from the edges of the repair identifies this clear zone. The cones are place on the centerline and both MOS edges forming the "T" clear zones.

Complete the CD-ROM, Minimum Operating Strip Layout, 3E5X1C-19.2., for detailed instruction on performing **Minimum Airfield Operating Surface Marking System layout procedures. Upon completion of the above mention CD-ROM layout a new MOS centerline and required "T" clear zones.**

NOTE:
The review questions for this material are contained in the above-mentioned CD-ROM

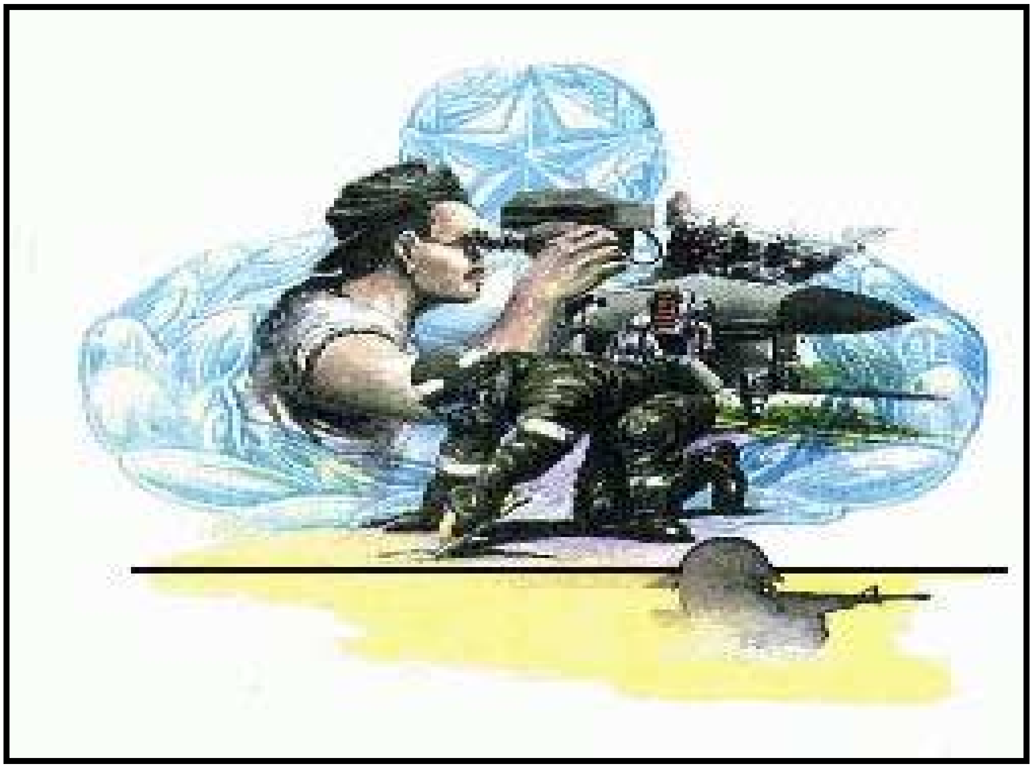
NOTE:
There is no CerTest for MOS layout. Hands on certification, per performance checklist, required as a minimum for upgrade training.

Notice. This AFQTP is *__NOT__* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

IDENTIFY MOS CENTERLINE LAYOUT REQUIREMENTS
&
IDENTIFY "T" CLEAR ZONE

Performance Checklist		
Step	**Yes**	**No**
1. Was the new MOS centerline properly referenced from the existing centerline?		
2. Was centerline cones offset 2' to the left allowing for paint stripping operations?		
3. Were the centerline cones accurately aligned?		
4. Were centerline cones properly spaced at approximately 200' intervals?		
5. Was "T" clear zone layout accomplished properly?		
6. Was a minimum of 100' left between the crater and the "T" clear zones?		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the minds of both the trainee and trainer.



EXPEDIENT MOS CENTERLINE LAYOUT

MODULE 19 AFQTP UNIT 2

ALIGN MOBILE AIRCRAFT ARRESTING SYSTEMS (MAAS) PROCEDURES (19.2.3.)

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

ALIGN MOBILE AIRCRAFT ARRESTING SYSTEM (MAAS)

Task Training Guide

STS Reference Number/Title:	19.2.3. Align Mobile Aircraft Arresting System (MAAS) Procedures
Training References:	• AFPAM 10-219, Vol. 3,4 & 5 • Technical Orders 35E8-2-10-1 • Technical Orders 35E8-2-11-2 • AFI 32-1043
Prerequisites:	• Possess as a minimum a 3E531 AFSC • Must have a basic knowledge of surveying
Equipment/Tools Required:	• 200' steel tape • Transit, Theodolite or Total Station instrument • Philadelphia or Range Rod • String • Spray paint / Keel • Stakes / Flags • Gloves, Hearing Protection, Eye Protection
Learning Objective:	• Should be able to accurately position and align a MAAS
Samples of Behavior:	• Be able to properly describe MAAS align and positioning procedures

Notice. This AFQTP is ***NOT*** intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

ALIGN MOBILE AIRCRAFT ARRESTING SYSTEM (MAAS)

Background: Critical to safe airfield operations is the aircraft arresting system. It is uneconomical to install permanent arresting systems at every site needed to support air missions. The Mobile Aircraft Arresting System (MAAS) is a rapidly deployable system configured to increase airfield safety operations. The original MAAS configuration was designed with airfield recovery operations in mind. It was a unidirectional system and once installed, didn't allow for heavy aircraft operations. This type of configuration is installed with little or no assistance from the engineering career field. Current MAAS units are being upgraded to provide bi-directional capabilities. Additionally fairlead beams can be installed with the MAAS units allowing heavy aircraft operations. A fairlead beam is an apparatus installed at the runway edge so the MAAS unit can be set back further from the runway, thus providing sufficient wing tip clearance for heavy aircraft. It is critical that the MAAS unit be properly aligned with the fairlead beam. The engineering member of the MAAS installation crew plays a vital role ensuring proper location and alignment of the fairlead beam and MAAS unit. The engineer is responsible for verifying that site selection meets sufficient slope and soil requirements thus ensuring the unit is positioned and aligned properly. This QTP will focuses on the alignment and positioning functions. However, site selection, slope requirements, and soil conditions will be briefly discussed.

In today's fast paced contingency world, civil engineers are frequently deployed in support of aircraft missions all over the world. The likelihood of a permanently installed arresting system being at the deployed location is very slim. One of the primary tasks is the installation of a MAAS unit with fairlead beam. It is vital for successful MAAS operations that the fairlead beam is properly positioned and aligned with the MAAS trailer and the runway surface.

There are three types of fairlead beams; the Light Weight Fairlead Beam (LWFB); the two-roller sheave, standard beam; and the three-roller sheave, standard beam. The LWFB is anchored using cruciform stakes, referred to as KM stake lines. The two and three roller beams are anchored with what is called a deadman anchoring system. The deadman anchoring system uses a series of chained weights buried in the ground. Engineering's role in the alignment of a MAAS unit without fairlead beam is limited and is actually not required. A small portion at the end of the QTP will cover the taping methods to sight in a MAAS unit without beams.

To perform this task, follow these steps:

STEP 1: SITE SELECTION The site selected should be relatively level and meet installation slope requirements. This minimizes or eliminates the need for grading the selected site. Locate the site approximately 1500 to 1800' from the threshold of the departure end of the runway. As a minimum, the distance from the runway has to accommodate a full tape run out (1250') and the length of the plane (nose to tail hook).

- **Barrier Location:**
  - 1500' – 1800' from runway threshold
  - 150' – 200' clear of taxiways
  - Ensure site conforms to soil requirements
  - Ensure site conforms to slope requirements
  - Check natural drainage of area

- **Soil Requirements:**
  - Basic MAAS installation requires a minimum CBR value of 7
  - The LWFB can be installed with a minimum CBR value of 7
  - LWFB should not be installed the same location as a previous installation unless the soil is re-compacted to a minimum CBR value of 15
  - KM anchoring system can be utilized with minimum CBR of 7
  - Deadman anchoring system is required for CBR < 7
- **Soil Conditions:**
  - Can be determined using airfield soil specification data
  - Can be determined by referring to Airfield Pavement Evaluation data
  - Can be field verified using a Dynamic Cone Pentrometer (DCP).
- **Slope Requirements:**
  - Runway slope is typically 1% - 1 ½%
  - 0% - 8% uniform slope is required over the length of free exposed tape
  - Exceeding slope of 8% can cause tape track problems
  - Tape should project 1' – 4' above the runway centerline
  - LWFB should be at least equal height to paved surface when positioned at runway edge
  - Single slope runways
  - MAAS can be inclined from a negative to positive slope up to 3%

STEP 2: MAAS and Fairlead Beam Positioning and Alignment This step is broken down in two sections; lightweight fairlead beam and standard fairlead beam alignment. Although there are two alignment methods, taping and instrument, this QTP concentrates on the instrument method, which is faster and more accurate. Before getting into the alignment method, an understanding of some general positioning formulas and terms are needed:

- **Fairlead Beam Positioning:**
  - Calculate distance from runway centerline to lead off sheave of fairlead beam
  - The formula used to determine the location of the fairlead beam lead off sheave is **Cable Length + 15', divided by 2**

HINT:
The 15' in the formula takes in account the distance of the two tape connectors

- **MAAS Trailer Positioning:**
  - Setback Distance – Distance from lead off sheave of fairlead beam to MAAS trailer exit sheave
    - -- This distance depends on the aircraft tip clearance
    - -- Usually this distance is determined by the barrier team chief in conjunction with the airfield operations chief
  - Split Distance – Distance from lead on sheave of fairlead beam to MAAS trailer exit sheave
    - -- Usually the barrier team chief in conjunction with the airfield operations chief determines this distance

SECTION I: LIGHTWEIGHT FAIRLEAD BEAM (LWFB):

1.1. Alignment Procedures:

1.1.1. Determine MAAS location from runway threshold/departure
- 1.1.1.1. Measure pre-determined distance (1500’-1800’)

1.1.2. Mark & setup instrument over point on runway centerline
- 1.1.2.1. Align instrument with runway centerline
- 1.1.2.2 Plunge scope to ensure alignment with centerline
- 1.1.2.3. Zero instrument

1.1.3. Turn 90° angle

1.1.4. Locate LWFB *lead off sheave* reference stake:
- 1.1.4.1. Measure pre-determined distance from paved surface of runway edge (cable length +15’/2)
- 1.1.4.2. Site and set reference stake

1.1.5. Locate LWFB *lead on sheave* reference stake:
- 1.1.5.1. Measure 15’ from lead off sheave reference stake (length of the beam)
- 1.1.5.2. Site and set reference stake

1.1.6. Locate MAAS trailer runway edge sheave reference stake:
- 1.1.6.1. Measure split distance (30’ min. up to 300’ max.)
  - ✓ Determined by Barrier Crew Chief
- 1.1.6.2. Site and set reference stake

1.1.7. Plunge scope

1.1.8. Locate LWFB & MAAS trailer reference stakes:
- 1.1.8.1. Use same procedures as section 1.1.4. – 1.1.6.

1.1.9. Position & stake LWFB:
- 1.1.9.1. Use instrument to site front & back alignment pins
- 1.1.9.2. Stake 4 corners of LWFB to secure its position

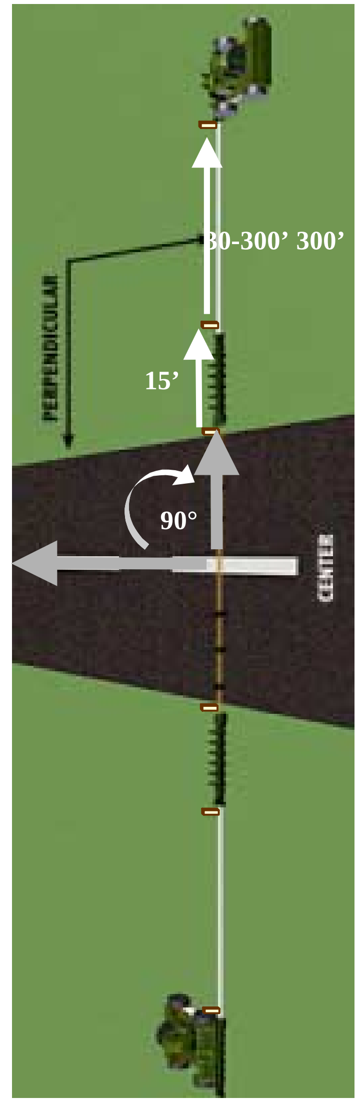


Figure 3

1.1.10. Position & stake MAAS trailer
- 1.1.10.1. Align trailer exit sheave with reference stake
  - ✓ Use instrument to ensure alignment of MAAS exit sheave with beam
- 1.1.10.2. Site on center of rollers where tape exits trailer or use range pole

2.1. Alignment Procedures for Fairlead Beam & MAAS trailer:
The procedures are similar to those associated with aligning the LWFB. The major difference the beams have to be offset for proper operations. The other difference is the need to locate the trenches for the anchoring systems.

2.1.1. Determine MAAS location from runway threshold/departure
- 2.1.1.1. Mark point with paint/keel
- 2.1.1.2. Set tack on runway centerline
  - ✓ Remove tack later for safe aircraft operations

2.1.2. Setup instrument on runway centerline
- 2.1.2.1. Set up & level instrument over tack
- 2.1.2.1. Align with runway centerline
- 2.1.2.2. Plunge scope to ensure alignment with centerline
- 2.1.2.3. Zero instrument

2.1.3. Measure and set offset tack
2.1.4. 40 5/8” offset for Two Sheave Fairlead
2.1.5. 17 1/2” offset for Three Sheave Fairlead
2.1.6. Ensure offset is in proper direction
2.1.7. Rotate instrument 90° to right
2.1.8. Locate *lead off sheave* of fairlead beam (closest to threshold):
- 2.1.8.1. Measure pre-determined distance from paved surface of runway edge (cable length+15’/2)
- 2.1.8.2. Site and set reference stake

2.1.9. Locate fairlead beam *lead on sheave* (farthest from threshold)
- 2.1.9.1.1. Measure 15’ (length of the beam)
- 2.1.9.1.2. Site and set reference stake

2.1.10. Locate MAAS trailer runway edge sheave reference stake:
- 2.1.10.1. Measure *Split Distance* (30’ min. up to 300’max.)
  - ✓ Determined by Barrier Crew Chief
- 2.1.10.2. Site and set reference stake

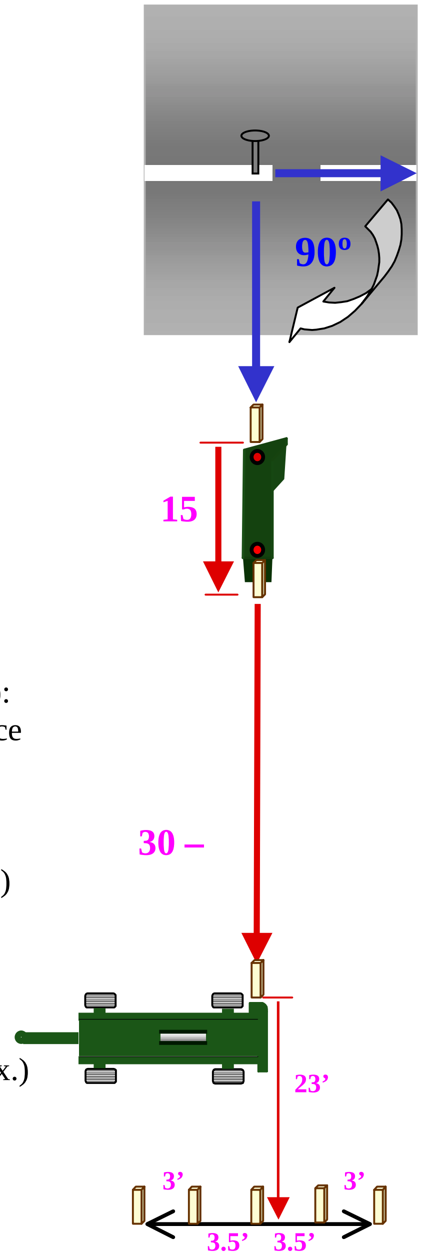


Figure 4

2.1.11. Locate MAAS trailer deadman trench
- 2.1.11.1. Measure 23’
- 2.1.11.2. Site and set reference stake (locates center of trench)
- 2.1.11.3. Locate chain trench reference stakes:
  - ✓ Measure 6.5’ both sides of stake (parallel to runway)

2.1.12. Position & stake fairlead beam:
- 2.1.12.1. Use instrument to site front & back alignment pins
- 2.1.12.2. Stake 4 corners of LWFB to secure its position

2.1.13. Position & stake MAAS trailer:
- 2.1.13.1. Use instrument to line alignment pin
- 2.1.13.2. Set range pole on alignment pin to aid in aligning trailer

2.1.14. Move & setup instrument over *offset* tack:
- 2.1.14.1. Set up & level instrument over tack
- 2.1.14.2. Align with runway centerline
  - ✓ Use same methods specified in section 2.12

2.1.15. Rotate instrument 90° to left

2.1.16. Locate, position, and stake fairlead beam & MAAS trailer
- 2.1.16.1. Use same methods specified in sections 2.1.5. – 2.1.11.

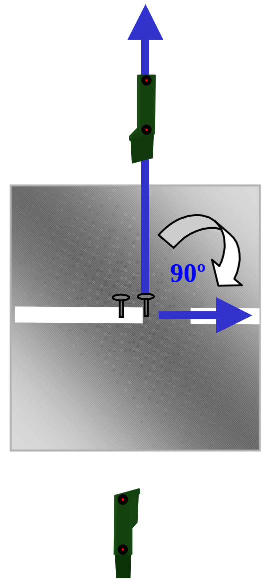


Figure 5

2.2 Locating Deadman Anchors for Fairlead Beam: (Figure 6)

2.2.1. Set up instrument over *lead off sheave* alignment pin
- 2.2.1.1. Level instrument
- 2.2.1.2. Site back on tack
- 2.2.1.3. Zero instrument

2.2.2. Rotate instrument 60° to left
- 2.2.2.1. Measure 15' from outer edge of fairlead beam
- 2.2.2.2. Site and set stake
  - ✓ Identifies center of deadman trench
- 2.2.2.3. Measure & set stakes 3 ½' each side of stake, perpendicular (⊥) to line of instrument
  - ✓ Locates chain trenches
- 2.2.2.4. Measure/set stakes 3' each side from chain trench stake
  - ✓ Locates outer edges of deadman trench

2.2.3. Site back on runway centerline tack (0°)

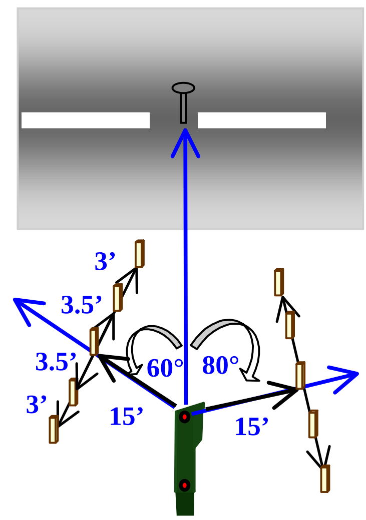


Figure 6

2.2.4. Rotate instrument 80° to right
- 2.2.4.1. Measure 15' from outer edge of fairlead beam
- 2.2.4.2. Site and set stake
  - ✓ Identifies center of deadman trench
- 2.2.4.3. Measure & set stakes 3 ½' each side of stake, ⊥ to line of instrument
  - ✓ Locates chain trenches
- 2.2.2.4. Measure & set stakes 3' each side from chain trench stake
  - ✓ Locates outer edges of deadman trench

This concludes the alignment and positioning portion where engineering is vital to a successful installation. At times a MAAS unit may be installed without beams. If so, then a line of sight is all that is required. Below is a quick taping method to sight in a MAAS unit installed on the runway's edge.

- **MAAS Taping Method** (Figure 7)**:**
  - Hold the "0" end of the tape at Point "A" (Centerline of runway) and measure 30 ft down the centerline of the runway and mark it (D1).
  - Still holding the "0" end of the tape on Point "A" measure 40 ft out from the centerline as close to perpendicular as possible and mark that location by swinging an arc. Do this step to both sides of the centerline.
  - Move the "0" end of the tape to Point D1 and measure 50 ft out from Point D1 and put a mark at the point you intersect at each of the arcs you just made and call them Point D2 and D3.
  - Using a string pull a line across points D2, A and D3. This will give you higher accuracy for perpendicular alignment of your MAAS placement.

> **NOTE:**
> Under no conditions should the MAAS or fairlead beam be angled so that the projected tape path interferes with the ground or runway surface. However, a slope equal to the runway surface is acceptable.

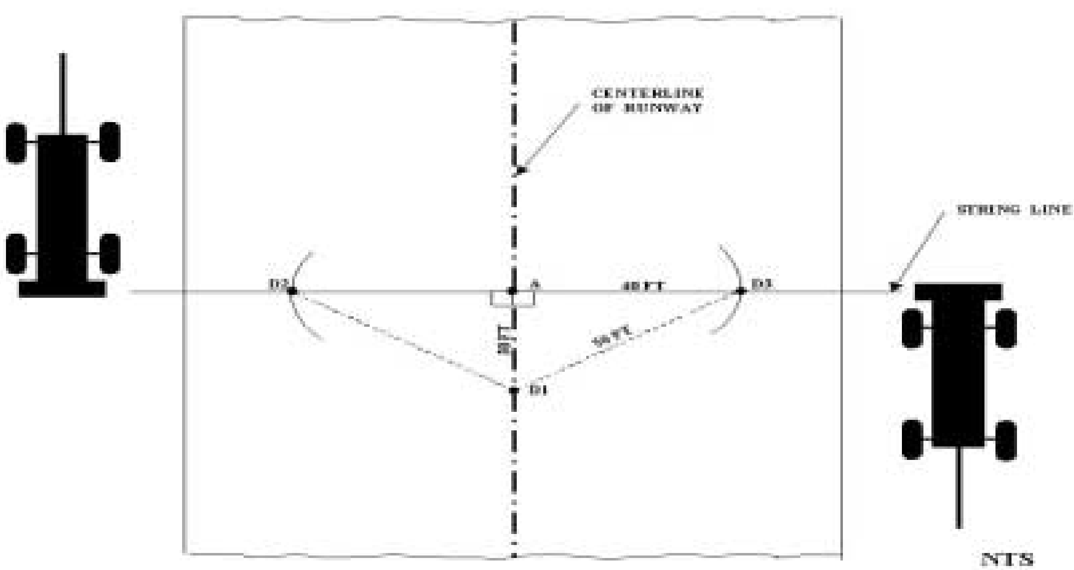


Figure 7, Taping Method

Review Questions
for
Align Mobile Aircraft Arresting System (MAAS) Procedures

Question	Answer
1. A soil with a minimum California Bearing Ratio (CBR) of _____ is acceptable for installation of a Light Weight Fairlead Beam (LWFB) on undisturbed soil.	a. 15 b. 7 c. 12 d. 23
2. How far from the runway centerline is the fairlead lead off sheave located?	a. 15’ b. Cable length + 15 c. Cable length + 15/2 d. Cable length + 7.5/2
3. The fairlead beam is installed in conjunction with the MAAS unit for what reason?	a. Provide wing tip clearance for fighter aircraft operations b. Provide wing tip clearance for heavy aircraft operations c. To increase MAAS installation time d. To increase the number of TDYs for 3E5X1s
4. What is the offset when installing a two-sheave fairlead beam?	a. 15’ offset b. 17 1/2” offset c. 40 5/8” offset d. Whatever the site “D” decides

NOTE: After completing all lessons, for Mobile Aircraft Arresting System (MAAS), see your Unit Education and Training Manager to take the following **mandatory** CerTest:

Test no.	**Title**
8142	**Mobile Aircraft Arresting System (MAAS)**

Align Mobile Aircraft Arresting System (MAAS) Procedures

Performance Checklist		
Step	**Yes**	**No**
1. Was the MAAS site properly chosen? (a) Barrier Location (b) Slope Requirements (c) Soil Conditions		
2. Were the proper procedures for MAAS positioning with and without the Fairlead Beams identified? (a) Locate proper point on centerline of runway (b) Locate fairlead beam lead off sheave (c) Verify edge sheave points are perpendicular to runway (d) Align the MAAS trailer with the fairlead beam		
3. Were the proper offsets laid out for the two and three sheave fairlead beam?		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the minds of both the trainee and trainer.

Air Force Civil Engineer

QUALIFICATION TRAINING PACKAGE (QTP)

REVIEW ANSWER KEY

For

ENGINEERING

(3E5X1)

MODULE 19

AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

Perform Airfield Damage Assessment Survey & Perform Explosive Ordnance Reconnaissance (EOR)

(3E5X1 - 19.1.1.2. & 19.1.1.3)

Questions	Answers
1. What is the Airfield Damage Assessment Team (ADAT) composition?	b. 2- EOD technicians, 1-3E5X1s, 1-Augmentee
2. When expressing crater location, what measurement is used?	c. The center of the crater
3. What does the letter "S" identify when locating airfield damage?	b. Spall
4. How are grid coordinates read?	b. Right and up
5. How are large bomblet fields located?	b. Using the double point coordinate system

Perform Airfield Damage Plotting

(3E5X1 - 19.1.1.7)

Questions	Answers
1. How are crater sizes plotted?	c. Double the apparent diameter
2. When plotting the coordinate X450R60, what does the number 450 indicate?	d. Distance from the zero point reference
3. When plotting the coordinate S 850R35W50F1900L15W75N250, what does N250 indicate?	b. 250 spalls

Align Mobile Aircraft Arresting System (MAAS) Procedures

(3E5X1-19.2.3.)

Question	Answer
1. A soil with a minimum California Bearing Ratio (CBR) of _____ is acceptable for installation of a Light Weight Fairlead Beam (LWFB) on undisturbed soil.	b. 7
2. How far from the runway centerline is the fairlead lead off sheave located?	c. Cable length +15/2
3. The fairlead beam is installed in conjunction with the MAAS unit for what reason?	b. Provides wing tip clearance for heavy aircraft operations
4. What is the offset when installing a two-sheave fairlead beam?	c. 40 5/8” offset